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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/003,258	12/06/2001	Nobuyuki Ohminami	829-593	4463

7590 04/08/2003

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EXAMINER

HAMDAN, WASSEEM H

ART UNIT PAPER NUMBER

2854

DATE MAILED: 04/08/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

**Office Action Summary**

Application No.

10/003,258

Applicant(s)

OHMINAMI, NOBUYUKI

Examiner

Wasseem H Hamdan

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 18 March 2003.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-10 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-3 and 5-9 is/are rejected.
- 7) ☒ Claim(s) 4 and 10 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☒ The proposed drawing correction filed on 18 March 2003 is: a) ☐ approved b) ☒ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

**Priority under 35 U.S.C. §§ 119 and 120**

- 13) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some \* c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

**Attachment(s)**

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) \_\_\_\_\_.
- 4) ☐ Interview Summary (PTO-413) Paper No(s). \_\_\_\_\_.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_.

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### **Part III - DETAILED ACTION**

#### ***Amendment***

1. This office action is in response to applicant's amendment filed on 03/18/2003.
2. The rejection of claims 1-3 and 7 under 35 U.S.C. 102(b) as being anticipated by Japanese Patent Laid-Open No. 06-112289 (inventor: Kono Motohiro et al.) has been maintained.
3. The rejection of claims 5 and 6 under 35 U.S.C. 103(a) as being unpatentable over Japanese Patent Laid-Open No. 06-112289 (inventor: Kono Motohiro et al.) in view of Japanese Patent Laid-Open No. 11-150246 (OKI Electric IND LTD) has been maintained.
4. The objection to the drawings 5, 8 and 9 has been withdrawn as necessitated by the amendment.
5. The objection to drawing 1 has been maintained.

#### ***Drawings***

6. The drawings are objected to because box 1 of figure 1, require descriptive legends. Correction is required.

#### ***Claim Rejections - 35 USC § 102***

7. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless -

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(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

8. Claims 1-3 and 7-9, are rejected under 35 U.S.C. 102(b) as being anticipated by Japanese Patent Laid-Open No. 06-112289 (inventor: Kono Motohiro et al.).

Regarding claims 1 and 8, Kono Motohiro et al. discloses an insulator capacitance analyzer for analyzing C-V characteristics [page 3 [0001]; page 16 (Drawing 5)] of a first MIS structure having unknown capacitance [page 15 (Drawing 2; page 4 [0013])], comprising:

a capacitance structure having known capacitance [Drawing 2 (VfbMAIS); page 4 [0010]] and configured so as to be serially connectable to the first MIS structure [Drawing 2 (VMAIS); page 4, lines 1-5]; and

a measuring section [page 16, Drawing 5 (box on the right hand side , since the drawings is not in English, it is verified on US Patent 5,233,291, Fig. 2 (a, 400)], for measuring synthesis capacitance [page 4, line 1] of the serially-connected first MIS structure and capacitance structure [page 15, Drawing 2 (VMAIS); page 4, lines 3-4] .

Regarding claims 2 and 9, Kono Motohiro et al. discloses where in the capacitance structure includes at least one of a second MIS structure, a dielectric, and a capacitor [page 15, Drawing 2; page 4 [0013]].

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Regarding claim 3, Kono Motohiro et al. discloses wherein the capacitance structure is configured so as to be removable from the insulator capacitance analyzer [page 16, Drawing 5].

Regarding claim 7, Kono Motohiro et al. discloses an insulator capacitance analysis method for analyzing C-V characteristics [page 3 [0001]; page 16 (Drawing 5)] of a first MIS structure having unknown capacitance [page 15 (Drawing 2; page 4 [0013]), comprising the steps of:

serially connecting the first MIS structure to a capacitance structure having known capacitance [Drawing 2 (VfbMAIS); page 4 [0010]; Drawing 2 (VMAIS); page 4, lines 1-5; [page 15, Drawing 2 (VMAIS); page 4, lines 3-4]; and

measuring synthesis capacitance of the serially-connected first MIS structure and capacitance structure [page 16, Drawing 5 (box on the right hand side , also verified on US Patent 5,233,291, Fig. 2 (a, 400)); page 4, line 1; page 15, Drawing 2 (VMAIS); page 4, lines 3-4].

calculating capacitance of the first MIS structure based on the synthesis capacitance [page 4 [0017]].

### ***Claim Rejections - 35 USC § 103***

9. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are

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such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

10. Claims 5 and 6, are rejected under 35 U.S.C. 103(a) as being unpatentable over Japanese Patent Laid-Open No. 06-112289 (inventor: Kono Motohiro et al.) in view of Japanese Patent Laid-Open No. 11-150246 (OKI Electric IND LTD).

Regarding claim 5, Kono Motohiro et al. discloses the essential elements of the claimed invention. However, Kono Motohiro et al. does not explicitly wherein the equivalent silicon oxide thickness of the capacitance of the capacitance structure is 3 nm or more. Japanese Patent Laid-Open No. 11-150246 discloses wherein the equivalent silicon oxide thickness of the capacitance of the capacitance structure is 3 nm or more [English abstract]. It would have been obvious to a person having ordinary skill in the art at the time of the invention was made to modify the teachings of Kono Motohiro et al. by including wherein the equivalent silicon oxide thickness of the capacitance of the capacitance structure is 3 nm or more. The skilled artisan would have been motivated to modify Kono Motohiro et al. as above for because the appropriate thickness of silicon oxide film prevents leakage current [Japanese Patent Laid-Open No. 11-150246: advantage].

Regarding claim 6, Kono Motohiro et al. discloses the essential elements of the claimed invention. However, Kono Motohiro et al. does not explicitly wherein the capacitance structure is configured so as to prevent direct tunnel leakage current from flowing through the capacitance

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structure. Japanese Patent Laid-Open No. 11-150246 discloses wherein the capacitance structure is configured so as to prevent direct tunnel leakage current from flowing through the capacitance structure [Japanese Patent Laid-Open No. 11-150246: advantage]. It would have been obvious to a person having ordinary skill in the art at the time of the invention was made to modify the teachings of Kono Motohiro et al. by including wherein the capacitance structure is configured so as to prevent direct tunnel leakage current from flowing through the capacitance structure. The skilled artisan would have been motivated to modify Kono Motohiro et al. as above for because the appropriate thickness of silicon oxide film prevents leakage current [Japanese Patent Laid-Open No. 11-150246: advantage].

### *Claim Objections*

11. Claims 4 and 10 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

### *Allowable Subject Matter*

Claims 4 and 10, are allowable because the prior art does not anticipate or suggest the combination of all the elements of the claimed apparatus for analyzing Capacitance-Voltage characteristics of a Metal/Insulator/Semiconductor structure.

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Regarding claims 4 and 10, Kono Motohiro et al. discloses a plurality of capacitance structures each having known capacitance and configured so as to be serially connectable to the first MOS structure [page 15, Drawing 2], but the prior art of record does not teach:

a switch for selecting one of the plurality of capacitance structures as the capacitance structure.

*Response to Arguments*

12. Applicant's arguments filed on 03/18/2003 have been fully considered but they are not persuasive. The Amendment is insufficient to overcome the prior art of record.

Applicant's arguments on page 4 "JP 6-112289 is entirely unrelated to the invention of claim 1 for at least two reasons. First, JP 6-112289 discloses a non-contact type analyzer where the analyzer is spaced apart from the structure to be analyzed. Thus, the JP 6-112289 cannot possibly disclose or suggest the "serially-connected" aspect of claim 1. Second, JP 6-112289 discloses analyzing a MAIS (Metal/Air/Insulator/Semiconductor) structure - but not a MIS structure. In this respect, JP 6-112289 measures a MAIS, and then uses those measurements to approximate what characteristics would be of a MIS structure. ". The examiner respectfully disagrees. The JP 6-112289 reference discloses capacitance structure having known capacitance [Drawing 2 (VfbMAIS); page 4 [0010]] and configured so as to be serially connectable to the first MIS structure [Drawing 2 (VMAIS); page 4, lines 1-5]. As stated in the office action, all the claimed structural elements of claim 1 are taught by JP 6-112289 reference. The applicant's



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claims 1-3, 5-9 are apparatus claims and all the claimed structural elements are taught by JP 6-112289 in view of Japanese Patent Laid-Open No. 11-150246 (OKI Electric IND LTD) as explained in the office action.

Applicant's arguments on page 4 that the rejected under 35 U.S.C. 102(e) [presumably Section 102(b)]. The examiner respectfully agrees, it is a typographical error which it has been corrected in this action.

### ***Conclusion***

13. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the date of this final action.

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**14. Any response to this action should be mailed to:**

Commissioner of Patents and Trademarks

Washington, D.C. 20231

**or faxed to:**

(703) 308-7722 or (703) 308-7724, or (703) 305-3431, or (703) 305-3432 (for

formal communications intended for entry, please label "FORMAL" and sign as

attorney of record)

**Or:**

(703) 305-9724 (for informal or draft communications, please label "PROPOSED"

or "DRAFT" and prominently label PLEASE DELIVER DIRECTLY TO

EXAMINER)

Hand-delivered responses should be brought to Crystal Plaza 4 [fourth Floor  
(Receptionist)], 2201 South Clark Place, Arlington, VA. 22202.



Wasseem H. Hamdan

March 31, 2003



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